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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/783,936	02/20/2004	Jack C. Wybenga	2003.07.006.BN0	7287

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EXAMINER	
DUONG, CHRISTINE T	
ART UNIT	**PAPER NUMBER**
2416	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/783,936	WYBENGA ET AL.	
	Examiner	Art Unit	
	CHRISTINE DUONG	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 May 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05 May 2009 has been entered.

Response to Amendment

This is in response to the Applicant's arguments and amendments filed on 05 May 2009 in which claims 1-23 are currently pending.

Claim Rejections - 35 USC § 103

2. Claims 1, 3-5, 7-8, 10, 12-14, 16-17, 19, 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandis et al. (US Patent No. 6,654,343 B1 hereafter Brandis) in view of Krishna et al. (US Patent No. 6,563,837 B2 hereafter Krishna).

Regarding claims **1, 10, 19**, Brandis discloses a router, a communication network comprising a plurality of routers that communicate data packets to one another and to interfacing external devices, each of said plurality of routers and a method of routing data packets.

The limitation, a switch fabric (the following elements either alone or in combination of Ingress Scheduler 205, Switch Fabric 210, Egress Scheduler 215, fig. 2

or the following elements either alone or in combination of Ingress 300, Switch Fabric 330, Egress 360, fig. 3).

The limitation, a plurality of routing nodes coupled to said switch fabric, wherein each of said plurality of routing nodes comprises packet processing circuitry capable of transmitting data packets to, and receiving data packets from, said external devices (Ingress 300 and Egress 360, fig. 3 or input link 200 and output link 220, fig. 2) and further capable of transmitting data packets to, and receiving data packets from, other ones of said plurality of routing nodes via said switch fabric (Switch Fabric 330, fig. 3 or Switch Fabric 210, fig. 2).

The limitation, said switch fabric is capable of detecting that the output bandwidth of a first output of said switch fabric has been exceeded ("the egress may use the flow control messages to indicate that the particular flow has occupied its share of space in the egress buffers 212" column 5 lines 26-27) and, in response to said detection, said switch fabric causes a first one of said plurality of routing nodes to slow an input rate of data packets transmitted from said first routing node to a first input of said switch fabric ("the ingress scheduler 205 needs to slow down (e.g., send cells from that flow at a slower pace) or to stop sending additional cells from that flow" column 5 lines 27-31).

However, Brandis fails to specifically disclose detecting that the output bandwidth of a first output of said switch fabric has been exceeded, said data packets having a plurality of priority levels.

Nevertheless, Krishna discloses "if any one virtual input queue in any one output port exceeds the threshold occupancy rating, flow control is turned on for the input port

corresponding to that virtual input queue in that particular output port. As such, that input port stops sending cells and requests to that output port" (column 19 lines 48-53) and "Oldest Cell First. Using this algorithm, the network device can keep track of the lifetime of each cell queued in virtual output queues of each input port. As shown in FIG. 16, each input buffer having a queued input cell indicates the time stamp of that cell as a numerical value in the cell input buffers. For example, in input port 52 in FIG. 16, the head cell of virtual output queue 56 (input buffer position "d" from FIG. 1) has a time stamp of 15, while the head cell of virtual output queue 57 has a time stamp or 03, and finally, the head cell of virtual output queue 58 has a time stamp of 01. The higher the time stamp number, the older the cell. In other words, the higher the time stamp, the longer the cell has been queued. In an implementation of the invention using Oldest Cell First as an input selection algorithm, upon cell arrival in a VOQ, the cell, or the pointer to the cell maintained in the arbiter, is tagged with the current time stamp, indicating the time of cell arrival" (column 16 lines 44-61).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to detect that the output bandwidth of a first output of said switch fabric has been exceeded, said data packets having a plurality of priority levels because "using virtual input queues in the output ports increases fairness for data transferred through the network device" (Krishna column 18 lines 20-22).

Regarding claims **3, 12, 21**, Brandis and Krishna discloses everything claimed as applied above (see claims 1, 10, 19, respectively). In addition, Brandis discloses said first routing node comprises a first queue comprising a plurality of prioritized buffers

capable of storing data packets to be transmitted to said switch fabric ("the ingress 300 maintains the incoming flows in multiple flow queues. In this example, each flow is represented once across all of the flow queues. Cells in each flow are sent across the switch fabric 330 to the egress 360. In one embodiment, each flow queue is associated with a priority level" column 5 lines 40-45).

Regarding claims **4, 13**, Brandis and Krishna discloses everything claimed as applied above (see claims 3, 12 respectively). In addition, Brandis discloses said first routing node slows down a rate at which data packets are transmitted to said switch fabric from said first queue ("the ingress scheduler needs to slow the pace of sending cells from an offending flow" column 5 lines 66-67).

Regarding claims **5, 14, 22**, Brandis and Krishna discloses everything claimed as applied above (see claims 4, 13, 21 respectively). In addition, Brandis discloses said first routing node selects data packets to be transferred to said switch fabric from a first one of said plurality of prioritized buffers according to a priority value associated with said first prioritized buffer ("with the priority levels being from 0 to 8, the flow queue 305 is associated with the priority level 8 and the flow queue 310 is associated with the priority level 0. In one embodiment, the priority level zero (0) is a lowest priority level. A new flow arriving at the ingress 300 is placed in the flow queue associated with the priority level similar to the priority level of the flow" column 5 lines 45-51).

Regarding claims **7, 16**, Brandis and Krishna discloses everything claimed as applied above (see claims 3, 12 respectively). In addition, Brandis discloses said first routing node routes said data packets using Layer 3 routing information ("The packets

(e.g., IP packets) being transmitted from the ingress to the egress have variable lengths" column 4 lines 12-13).

Regarding claims **8, 17**, Brandis and Krishna discloses everything claimed as applied above (see claims 7, 16 respectively). In addition, Brandis discloses said Layer 3 routing information comprises an Internet protocol (IP) address ("The packets (e.g., IP packets) being transmitted from the ingress to the egress have variable lengths" column 4 lines 12-13).

3. Claims 2, 11, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandis and Krishna further in view of Murakami et al. (PG Pub US 2004/0179542 A1 hereafter Murakami).

Regarding claims **2, 11, 20**, Brandis and Krishna discloses everything claimed as applied above (see claims 1, 10, 19, respectively).

However, Brandis and Krishna fails to specifically disclose said switch fabric implements a Weighted Fair Queuing algorithm to slow said input rate of data packets from said first routing node.

Nevertheless, Murakami et al. teaches "in an input and output buffer switch that arranges buffer memories at input and output ports, respectively, the problem of the static occupation of an output circuit by specific connections can be improved by a buffer memory read scheduling criterion such as Weighted Fair Queuing (WFQ)" (Murakami [0007] Lines 5-10).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to implement a Weighted Fair Queuing algorithm to

slow the input rate of data packets from the first routing node because “a study of buffer memory read scheduling has been actively conducted as one of the techniques that are proposed to provide the QoS guarantee mechanism as mentioned above or a class-based priority control mechanism” (Murakami [0007] Lines 1-4).

4. Claims 6, 15, 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandis and Krishna further in view of Hesse (US Patent No. 6,289,021 B1).

Regarding claims **6, 15, 23**, Brandis and Krishna discloses everything claimed as applied above (see claims 5, 14, 22 respectively). However, Brandis and Krishna fails to specifically disclose said first routing node causes a first one of said external devices to slow a rate at which data packets are transmitted to said first queue.

Nevertheless, Hesse discloses "one method of reducing input rate is to specify that the external device connected to port 104 meters or otherwise reduces the frequency at which messages are injected” (column 37 lines 28-31).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to cause a first one of said external devices to slow a rate at which data packets are transmitted to said first queue “this technique places responsibility for the rate reduction on a device external to the switch” (Hesse column 37 lines 31-32).

5. Claims 9, 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brandis and Krishna further in view of Gruia (PG Pub US 2002/0135843 A1).

Regarding claims **9, 18**, Brandis and Krishna discloses everything claimed as applied above (see claims 3, 12 respectively). However, Brandis and Krishna fails to

specifically disclose said first routing node routes said data packets using Layer 2 medium access control (MAC) address information.

Nevertheless, Gruia teaches "the switch module is capable of performing layer 2 switching based on MAC addresses" (Gruia: [0051] Lines 13-14).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to route data packets using Layer 2 MAC address information because "the address table provides source and destination addresses for packets that are being forwarded through the switch module" (Gruia: [0051] Lines 9-11).

Response to Arguments

6. Applicant's arguments have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTINE DUONG whose telephone number is (571)270-1664. The examiner can normally be reached on Monday - Friday: 830 AM-6 PM EST with first Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Seema S. Rao/
Supervisory Patent Examiner, Art Unit 2416

/Christine Duong/
Examiner, Art Unit 2416
07/13/2009